

### REMARKS

In the Office Action, Claims 5-7 have been rejected as anticipated by the Bach reference; Claim 8 has been rejected as unpatentable over the combined teachings of Bach in view of Zhang; and, Claims 1-4 and 9-11 have also been rejected as unpatentable over the combined teachings of Bach and Zhang. Applicants respectfully disagree with the Examiner's interpretation of the Bach teachings, and with the conclusion that the combination of Bach and Zhang patent teachings would obviate the invention as claimed.

The Bach patent teaches an indexing method for an image search engine wherein, for each image to be stored, a feature vector is extracted from the images and is stored in a feature vector database. When a query is made to the database, a query vector is specified and all feature vectors from the database which are within a specified distance from the query vector are identified as possibly satisfying the query.

With specific reference to the language of independent Claim 5, the claim features include at least one database; a multidimensional indexing engine for indexing and retrieving indices, and a similarity query, engine wherein the similarity engine receives information regarding retrieved indices from the multidimensional indexing engine for identifying database areas

to be searched. While the Bach patent does include a database, an index generation component, and a similarity engine, Applicants respectfully assert that the Bach patent features do not anticipate the invention as claimed. With respect to the claim feature of at least one database storing information at said at least one server in a system having at least one client location and at least one server location, Applicants note that the Bach patent is not directed to a client-server environment for image storage and retrieval.

With regard to the second claim feature, of the multidimensional indexing engine for indexing and retrieving indices, Applicants respectfully assert that the Bach patent teachings regarding its index generation component do not anticipate, or even obviate, the claim feature. What is claimed is a multidimensional indexing engine which maintains indices related to the information stored in the database, which retrieves indices in response to queries, and which provides the information to the similarity query engine to identify areas of the database to be searched. It is first to be noted that the Bach index generation component generates an index value on an extracted feature vector (see: component 220 of Fig. 3 and associated teachings), while what is claimed provides multidimensional indexing. Further, the Bach index generation component does not retrieve indices in response to queries. Once the Bach index generation component generates an index value on a

feature vector, the index generation component has no further role in the indexing and querying process. The claimed multidimensional indexing component, however, is adapted to additionally participate in the retrieval/query process by retrieving indices in response to queries and further by providing the information to the similarity query engine to identify areas of the database to be searched. Finally, while Bach has a similarity engine, the Bach similarity engine, component 330 of Fig. 3, is not a similarity query engine for receiving information regarding retrieved indices from the multidimensional indexing engine which identifies database areas to be searched.

With specific reference to the Examiner's remarks, the Examiner has stated that "[T]hese [Bach index] values are indexed by the internal index structure for high dimensional data of the database." Applicants respectfully assert that indexing by a data structure for high dimensional data does not necessarily mean multidimensional indexing. Particularly since Bach shows that index generation follows feature vector creation, it would appear that Bach is using a simple indexing for each vector. Simply because a system is operating on highly dimensional data does not automatically mean that that system is indexing on many dimensions. The present invention explicitly recites a multidimensional indexing engine.

The Examiner further states, citing Col. 6, lines 40-42, that "...the engine 300 runs on a storage server which provides a limited set of well-known indexed structures..". Again, Applicants assert that such teachings do not provide for a multidimensional indexing engine as is set forth in the pending claims. Bach further explicitly teaches, at Col. 6, lines 44-46, that "[I]n this case, the indexed structure can be implemented...to have the lowest expected search time." Applicants respectfully assert that the Bach teachings not only do not anticipate a multidimensional indexing engine, but in fact teach away from such an engine since those Bach teachings would direct one to a one-dimensional indexing.

Finally, the Examiner states that "[T]he {Bach} index values are used to reduce the number of feature vectors that are retrieved from the database to complete a query... [at the] similarity engine." In support of that conclusion, the Examiner cited the following Bach teachings: an index definition at Col. 2, lines 21-25; a phrase referring to generating an index structure which corresponds to the feature vector at Col. 3, lines 11-13; and, Col. 25-35, which do not exist in the Bach patent. Applicants respectfully assert that the cited teachings do not support a conclusion that the claimed multidimensional indexing engine and claimed similarity engine are anticipated.

For a reference to anticipate claim language under 35 USC § 102, that reference must teach each and every claim feature.

Applicants respectfully assert that the Bach patent does not teach the claimed multidimensional indexing engine, or the claimed similarity engine; and cannot, therefore, be said to anticipate independent Claim 5, or Claims 6-7 which depend therefrom and add limitations thereto. With regard to the further limitations added in Claims 6 and 7, Applicants further assert that the Bach patent teachings do not provide a means for receiving user input regarding retrieved information (Claim 6), or the multidimensional indexing engine adapted to refine indices based on user input (Claim 7). While the Bach patent does show that user weights are factored into constraint generation for query processing (see: 214 of Fig. 3 and associated teachings), Bach has pre-defined user constraints and does not teach or suggest that user interaction is ongoing, as is provided for in Claims 6 and 7. Moreover, any "user input" of Bach, albeit predefined, is clearly shown as being used to modify the query. Claim 7, however, expressly recites that the indices are modified based on the user input. Therefore, it is the database information that is being modified and not the query. Clearly, it cannot be maintained that the Bach patent teaches, or even suggests, such claim language.

With regard to the balance of the claims, Claims 8, 1-4 and 9-11, which have been rejected as obviated by the combined teachings of Bach and Zhang, Applicants respectfully assert that the combination of references would not render the present claims

obvious. As set forth in detail above, the Bach patent does not provide any teachings which anticipate or obviate the claimed multidimensional indexing engine or the similarity engine of the present invention. Moreover, the Zhang patent does not provide those teachings which are missing from the Bach patent. What the Zhang patent is directed to is a data structure for clustering data in very large databases. While one having skill in the relevant art might look to utilize the Zhang data structure in the Bach database, the combination would not result in the invention as claimed. With specific reference to the language of Claim 8, Applicants note that the Bach and Zhang combination still would not provide for the claimed multidimensional indexing engine, nor the similarity engine as set forth in independent Claim 5. Further, Claim 8 includes the limitations of means for displaying retrieved information to a user and for receiving user input (Claim 6), as well as processor means for reformulating the query based on user input. It has been demonstrated above that the Bach patent does not provide the interactive user input as claimed. The cited Zhang teachings regarding iterative optimization do not supply the teachings missing from Bach. Zhang's iterative optimization is a data structuring process which does not involve any user input and is not "query-based" (i.e., is not done in response to a query). Therefore, even if one were to combine Zhang and Bach, one would not arrive at the invention as set forth in Claim 8.

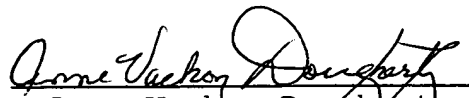
Similarly, Applicants assert that the remaining claims, 1-4 and 9-11, are not rendered obvious by the combination of teachings of Bach and Zhang. Claims 1 and 9, which are the two remaining independent claims and which are parallel in scope to each other, both expressly recite the steps of presenting retrieved data to a user, receiving user input, and transforming the database based on user input. The Examiner acknowledges, at the top of page 8 of the Office Action, that the Bach patent does not disclose the claimed limitation. However, the Examiner goes on to cite the Zhang statement that "the method should be able to accept feedback from users to interactively fine-tune the search for patterns", from Zhang, Col. 1, lines 34-35. Applicants respectfully assert that the Zhang statement that such user interaction is desirable is not a teaching which could be combined with Bach! Zhang is simply listing four areas of data mining which can improve the data mining process. Zhang then goes on to concentrate its efforts on one of those areas, specifically Summarization. The basic statement that interaction is desirable is not enough to motivate one to modify the Bach patent teachings in such a way as to arrive at the invention as claimed. While Zhang goes on to provide data clustering which may be used as a Bach data structure, Zhang does not provide any explicit teachings regarding when, where, and how to provide user interaction. Applicants respectfully assert that the Zhang patent does not provide adequate teachings to motivate one to

modify the Bach patent in such a way as to arrive at the invention as claimed. Neither Zhang nor Bach provides any suggestion that the database be transformed based on user input during query processing. Absent some suggestion, and some supporting teachings, one having skill in the art would not seek to modify Bach in such a way as to arrive at the invention as claimed. Applicants respectfully request reconsideration of the rejections based on the combination of teachings of Bach and Zhang, and withdrawal of those rejections.

Based on the foregoing remarks, Applicants respectfully request withdrawal of the rejections, and issuance of the claims.

Respectfully submitted,  
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